CITY OF LINCOLN, NEBRASKA, STANDARD SPECIFICATIONS

Chapter 6

PORTLAND CEMENT CONCRETE CURBS AND MEDIAN CONSTRUCTION

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PORTLAND CEMENT CONCRETE CURBS AND MEDIAN CONSTRUCTION

6.00 GENERAL

Portland cement concrete curbs and medians shall be constructed of the materials as herein specified, on an approved subgrade, in accordance with these Specifications and in conformity with the lines, grades, typical cross sections and details shown on the plans.

6.01 RELATED ITEMS SPECIFIED ELSEWHERE

Chapter 1 Pavement Construction & Reconstruction
Chapter 2 Earthwork
Chapter 3 Portland Cement Concrete Pavement
Chapter 4 Portland Cement Concrete Base

6.02 MATERIALS

A. CONCRETE

Unless otherwise specified all concrete shall be L3500 or LC3500 as described in Chapter 11 of these Specifications .

B. TIE BARS

All reinforcement bars shown on the plans shall conform to the requirements of "Standard Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement"ASTM A 615 (A 615M), Grade 40 (300) or grade 60 (420) and shall be free from rust, scale or other substances.

C. PREFORMED EXPANSION JOINT MATERIAL

When specified for use, expansion joint material shall conform to "Standard Specifications for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)" ASTM Designation D 1751. The joint material shall be 1 inch thick unless otherwise specified.

D. JOINT SEALER

The joint sealer shall conform to the requirements of "Concrete Joint Sealer, Hot-Poured Elastic Type", ASTM Designation D 1190, and shall meet or exceed the testing requirements of "Standard Test Methods for Sealants and Fillers, Hot Applied for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements" ASTM Designation D 5329 and the flow shall not exceed 20 mm.

E. CURING COMPOUNDS

All curing compounds shall be as described in Section 3.02.G. of these Specifications.

6.03 PREPARATION OF SUBGRADE

The subgrade for all types of curbs and medians shall be prepared in accordance with Chapter 2 of these Specifications.

No measurement or direct payment shall be made for preparation of subgrade. Preparation of subgrade shall be considered subsidiary to other items of work for which direct payment is made.

6.04 FORMS

A. SLIP-FORMS

All curbs shall be constructed using slip form paving equipment, except when specifically authorized by the Engineer.

Slip-form equipment shall be provided with traveling side and top forms of suitable dimensions, shapes, and strength to support the concrete for a sufficient length of time during placement to produce the required cross section. The equipment shall spread, consolidate and screed the freshly placed concrete in such a manner as to provide a dense and homogeneous product.

The slip-form equipment shall have automatic sensor controls which operate from an offset control line. The line and grade of the slip-form equipment shall be automatically controlled.

B. RIGID FORMS

Forms shall be set rigidly in place and have a uniform bearing on the approved subgrade, and shall be in conformity with established line and grade. The forms must be kept constantly straight and true with not more than 1/8 inch variation in horizontal or vertical alignment for each 10 feet in length. The forms shall be cleaned after each use and oiled with a light clear paraffin base oil which will not discolor or otherwise injure the concrete. Removal of the forms will not be permitted until the concrete has been in place for at least twelve (12) hours. Upon removal of the forms, all honeycombed areas or small defects shall be pointed up properly with a one part cement to two parts sand (1:2) mix grout. The concrete previously protected by the forms shall be cured as hereinafter specified or as directed by the Engineer.

No measurement or direct payment will be made for forms or slip-forming. The cost of forms or slip-forming shall be considered subsidiary to other items of work for which direct payment is made.

6.05 PLACING TIE BARS

Reinforcement bars shall be placed between the curb or curb and gutter and the pavement to act as tie bars on all paving projects and shall conform to the requirements of Section 6.02(b) herein. The tie bars shall be placed as shown on the drawings.

Tie bars will not be measured or paid for directly. The cost of the tie bars shall be considered subsidiary to the cost of those items for which direct payment is made.

6.06 CONCRETE PLACEMENT

The concrete shall be placed on an approved subgrade. To prevent the absorption of moisture from the newly deposited concrete, the subgrade shall be kept moist by light applications of water until the concrete has been placed.

A. VIBRATING

All concrete, whether placed by machine or by hand methods, shall be compacted thoroughly by means of mechanical vibrators approved by the Engineer. The vibrator shall consolidate the full depth and width of the concrete to a uniform mass without segregation and free from excessive surface mortar at a single passage of the machine. Machine mounted vibrators shall be operated only when the machine to which they are attached is moving. The vibrators shall be placed so as to allow a minimum of vibration overlap.

No measurement or direct payment will be made for vibrating. Vibrating shall be considered subsidiary to other items of work for which direct payment is made.

B. FINISHING

If the consolidation and finishing of the concrete is accomplished by either machine or hand methods, the following requirements shall apply and all equipment used shall meet the approval of the Engineer. Unless otherwise provided in the Special Provisions, hand finishing as described herein may be employed only in cases of emergency and where mechanical methods are impractical.

1. Machine Finish

The finish machine shall be capable of placing, consolidating, striking off, shaping and float-finishing the freshly placed concrete to the desired line, grade, and thickness in one continuous passage in such a manner that a minimum of finishing by hand methods will be required.

The forward speed of the finishing machine or finishing machines, shall be adjusted to the average progress of the concrete production, in order that the slip form operations shall be as continuous and uninterrupted as possible.

Concrete shall be fed to the machine at a uniform rate. The machine shall be operated at a uniform rate to produce a well compacted mass of concrete free from surface pits.

The concrete shall be of such consistency that after placement it will maintain the shape of the required curb section without support.

The top and face of the finished curb shall be true and straight. The top surface of curbs shall be of uniform width, free from humps, sags, or other irregularities. When a straightedge 10 feet long is laid on the top or face of the curb or on the surface of gutters, the surface shall not vary more than 1/8 inch from the edge of the straightedge, except at grade changes or curves.

B. FINISHING (Continued)

1. Machine Finish (Continued)

In general, the addition of superficial water to the surface of the concrete to assist in finishing operations will not be permitted. However, due to unavoidable delay in finishing or an unusual drying condition, a slight quantity of water may be added to the surface of the concrete as an aid in finishing. If it becomes necessary to add water to the surface to complete the finishing of the concrete, all mixing operations shall be discontinued immediately until the finishers catch up to a point where extra water for finishing is no longer required. If the application of water to the surface is permitted, it shall be applied in a fog spray by means of an approved orchard-type sprayer. Spray equipment which is attached to the mechanical finisher or any other paving equipment will not be permitted. The addition of superficial water to the surface of the concrete shall be at the Contractor's risk. The concrete shall be given a final finish by means of a wet burlap, carpet or broom drag over the full width, drawn over the surface in a longitudinal direction. The drag shall be suspended from a mandrel, or similar device, to insure evenness throughout the width of the drag. The drag shall be lifted from the surface of the concrete pavement when the finish machine is not in motion for thirty minutes or more, and carefully replaced before resuming the dragging operations. Drags shall be rinsed or washed at least every four (4) hours. Drags that cannot be cleaned shall be discarded and new drags substituted.

After the final drag finish, hand-formed or machine-formed joints shall be finished or refinished and the concrete over the joints carefully removed.

2. Hand Finish

The concrete shall be placed in such a manner that it can be consolidated, struck off, shaped and float finished so there will be no segregation of the concrete.

After the concrete has been deposited and spread, it shall be consolidated at maximum intervals of 2 feet longitudinally with approved vibrators, shaped with heavy templates or floats approved by the Engineer until the concrete is true to prescribed cross section, and struck off to a uniform height above the finished grade specified. The height of the strike-off above the grade shall be gauged as directed by the Engineer. In no case shall it be so scant that the surface of the concrete after tamping will be found below grade. The templates and floats used shall be of a design and construction suitable and adequate for the purpose required and for convenient use. They shall be of steel or steel-shod wood and shall have sufficient strength and stiffness to retain their shape under all working conditions. The working or screening edge shall be curved to the required cross section of the curb. The template or screed used for striking off shall be arranged so that when riding on the side form, the working edge will have an excess of concrete above grade to the height of strike-off determined and ordered by the Engineer.

6.06 CONCRETE PLACEMENT (Continued)

B. FINISHING (Continued)

2. Hand Finish (Continued)

In general, the addition of superficial water to the surface of the concrete to assist in finishing operations will not be permitted. However, due to unavoidable delay in finishing or an unusual drying condition, a slight quantity of water may be added to the surface of the concrete as an aid in finishing. If it becomes necessary to add water to the surface to complete the finishing of the concrete, all mixing operations shall be immediately discontinued until the finishers catch up to a point where extra water for finishing is no longer required. If the application of water to the surface is permitted, it shall be applied in a fog spray by means of an approved orchard type sprayer. Spray equipment which is attached to the mechanical finisher or any other paving equipment will not be permitted. The addition of superficial water to the surface of the concrete shall be at the Contractor's risk.

No direct payment will be made for placing and finishing the concrete. Placing and finishing the concrete shall be considered subsidiary to other items of work for which direct payment is made.

C. CURB DROPS

Curb drops shall be constructed at locations shown on the plans or as directed by the Engineer for the future construction or reconstruction of driveways or access ramps. No direct payment will be made for the work of constructing curb drops. The cost thereof shall be considered subsidiary to the item or items CONCRETE CURB or COMBINED CURB AND GUTTER.

6.07 JOINTS

A. CONTRACTION JOINTS

Contraction joints shall be spaced as shown on the drawings or at a spacing approved by the Engineer. The joints shall be made while the concrete is workable. The joint shall be cut with a pointing trowel to a minimum depth of 3 inches on all sides. Joints shall be rounded with a tool having a maximum radius of 3/8 inch.

B. EXPANSION JOINTS

A 1 inch expansion joint shall be placed full depth in all curbs at locations indicated on the plans or as directed by the Engineer. The joint shall be constructed of preformed non-extruding joint material. The joint shall be shaped accurately to fit the section of the curb. These expansion joints shall line up across the street.

C. JOINT SEALING

Joint sealing shall be accomplished as provided in Section 3.07 paragraph D.

No measurement or direct payment will be made for joints or joint sealing. This work shall be considered subsidiary to other items of work for which direct payment is made.

6.08 CURING AND PROTECTION

Curing and protection of concrete pavement work shall be in accordance with Section 3.08 of these Specifications

6.09 HOT AND COLD WEATHER CONSTRUCTION

Portland cement concrete pavement work shall be accomplished only as provided in Section 1.06 of these Specifications.

6.10 SUBSTANTIAL COMPLETION

Paving construction will be considered substantially complete when it meets all of the requirements of Section 1.07 of these Specifications.

6.11 BASIS OF PAYMENT

CONCRETE HEADER, COMBINED CURB AND GUTTER, CONCRETE BARRIER CURB, or CONCRETE MEDIAN CURB, completed in conformance with the plans and Specifications and accepted by the Engineer, shall be measured along the face of the curb through all inlets.

Payment shall be made at the contract unit price bid per linear foot for each type and size constructed. Such payment shall be full compensation for all preparation of subgrade, forms or slip forming, materials, labor, tools, equipment, jointing, finishing, curing, sawing, sealing, backfilling, clean up and incidentals necessary to complete the work.

CONCRETE MEDIAN NOSE, IN PLACE, completed in conformance with the plans and Specifications and accepted by the Engineer, shall be paid for at the contract unit price bid per each. Such payment shall be full compensation for all preparation of subgrade, forms, materials, labor, tools, equipment, jointing, finishing, curing, sawing, sealing, backfilling, clean up and incidentals necessary to complete the work.

CONCRETE MEDIAN SURFACING, 4" THICK, completed in conformance with the plans and Specifications and accepted by the Engineer, shall be measured and paid for at the contract unit price bid per square foot. Such payment shall be full compensation for all preparation of subgrade, forming, materials, labor, tools, equipment, jointing, finishing, curing, sawing, sealing, backfilling, clean up and incidentals necessary to complete the work.

TACK-ON MEDIAN, completed in conformance with the plans and Specifications and accepted by the Engineer, shall be measured and paid for at the contract unit price bid per square foot. Such payment shall be full compensation for all preparation of pavement surface, installation of dowels where necessary, forming, materials, labor, tools, equipment, jointing, finishing, curing, sawing, sealing, clean up and incidentals necessary to complete the work.